REVIEW ARTICLE

Personalized Medicine: A Confluence of Traditional and Contemporary Medicine

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ABSTRACT

Context • Traditional systems of medicine have attained great popularity among patients in recent years. Success of this system in the treatment of disease warrants consideration, particularly in cases for which conventional medicine has been insufficient.

Objective • This study investigates the similarities in principles and approaches of 3 traditional systems and explores whether conventional medicine is able to exploit the advantages of traditional systems.

Design • This study first identifies and explores the advantages of 3 well-known systems—traditional Iranian medicine (TIM), ayurveda, and traditional Chinese medicine (TCM)—that are similar in their basic principles and methods. Second, it clarifies whether and how conventional medicine could exploit the advantages of traditional systems as it modernizes, to become more personalized. Finally, this study investigates the possibility that conventional medicine could benefit from traditional typology to improve its personalization.

Results • The acknowledgment of the unity of humans and nature, applying rational methods, and personalized approaches is fundamentally similar in the 3 systems. Additionally, they all promote the holistic view that health is harmony and disease is disharmony of the body. Other similarities include their recognition of the unique nature of every person and their categorization of people into different body types. Although conventional medicine has mostly failed to incorporate the advantages of traditional medicine, its integration with traditional medicine is achievable. For instance, exploiting traditional typologies in genomic and other studies may facilitate personalization of conventional medicine.

Conclusion • From its review, the research team concludes that prospects are bright for the integration of traditional and conventional medicines and, consequently, for a dramatic improvement in health systems. (*Altern Ther Health Med.* 2014;20(5):31-40.)

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Lately, a general and growing trend toward the use of traditional medicines is discernible throughout the world. Today, systems of traditional medicine are becoming an inseparable component of health care in many countries.[1,2] Generally, patients are not familiar with these systems because their concepts, mechanisms, and methods are not completely explainable using current science. Therefore, what is the reason for this rising popularity?

Undoubtedly, the effectiveness of these systems has kept them from becoming obsolete for centuries. Their success in the treatment of disease, particularly in some cases where conventional medicine has proved ineffective, plays an important role in their popularity. Ayurveda, one of the oldest traditional systems in the world, has helped in many cases in which contemporary medicine has almost no answers[3] (eg, gynecological disorders and diabetes mellitus).[4,5] Some

Table 1. The Correspondences of Basic Elements in Traditional Iranian Medicine

Element	Air	Fire	Water	Earth
Correspondence				
Characteristic of element	**Relative lightness**	**Absolute lightness**	**Relative heaviness**	**Absolute heaviness**
Quality represented by element	**Warm and wet**	**Warm and dry**	**Cold and wet**	**Cold and dry**
Task of element	More ability to be shaped, fluidity, increasing lightness, decreasing compactness	Decreasing compactness, cooking, digestion, making light	Creation of flexibility, ability to be shaped, fluidity	Shaping, stabilizing, shape permanency
Humor	Blood	Bile	Phlegm	Black bile
Season	Spring	Winter	Winter	Autumn
Age	Childhood and adolescence (0-30 y)	Youth (30-40 y)	Old age (>60 y)	Middle age (40-60 y)
Organ	Liver, blood, muscle	Heart	Brain spinal cord, nerves, fatty tissue	Bone, hair, cartilage
Emotion	Worry	Anger excitement	Fear	Depression sadness
Taste	-	Bitter, spicy, salty	Sour, insipid	Sour

diseases—such as hepatitis, vitiligo, psoriasis, rheumatoid arthritis, and bronchial asthma—have been cured by Unani medicine, whereas conventional medicine has considered them to be difficult-to-cure diseases.[6] In addition, traditional Chinese medicine (TCM) has offered promising therapies for diseases such as liver cancer and fibrosis, asthma and food allergies, colorectal cancer, AIDS, and multiple sclerosis, each of which is presently a worldwide concern.[7-12]

Different systems of traditional medicine—such as traditional Iranian medicine (TIM), ayurveda, and TCM—differ from each other in principles, concepts, and methods. Nevertheless, they all have been similarly successful in treating patients and are gaining popularity. This success has led the current research team to the following questions: "Do these traditional systems share similarities that result in their successes, and how do they differ from conventional medicine in their approaches? What are the mysterious mechanisms that make them different from conventional medicine in the successful treatment of incurable cases? Could conventional medicine exploit the advantages of traditional systems? Does modernization of conventional medicine facilitate its integration with traditional medicine or widen the schism between them?"

To explore the questions, the research team identified the fundamental principles, philosophical understandings, and holistic views of 3 well-known systems of traditional medicine: TIM, TCM, and ayurveda. The team attempted to explain whether the systems share common basic principles and similarities. Furthermore, the team examined how traditional medicine and conventional medicine can interact on their paths to the future.

THE UNITY OF HUMANS AND THE NATURAL WORLD

Most traditional medicines assert a fundamental interconnection between human beings and nature, and body and nature are considered one. Everything in the universe, including humans, exists as a part of the natural world.

In TIM, which is one of the main branches and roots of Unani medicine,[13] the unity of humans and nature is believed to be caused by the fact that vegetables and animals, used as foods, are made up of basic elements. Foods are changed to the humor of blood in bodies, and blood is the origin of seminal fluid and ovule from which humans are produced.[14] In addition, the same qualities used to describe temperaments, humors, emotions, and organs inside the body are ascribed to external factors—elements, seasons, herbs, and foods (Table 1). TIM promotes the idea that these extrinsic qualities can affect and change the intrinsic qualities.

Furthermore, similar concepts emphasize the unity of humans and the natural world in ayurveda and TCM. These systems indicate that human body corresponds to weather, seasons, foods, and herbs (Table 2 and Table 3).[15] Therefore, practitioners who work with these traditional systems need to learn different sciences. In earlier times, practitioners of TIM were called *hakim*, which means a "wise and learned person who has comprehended the different sciences and realized the cosmos correctly."[16]

Table 2. The Correspondences of Basic Elements in Ayurveda

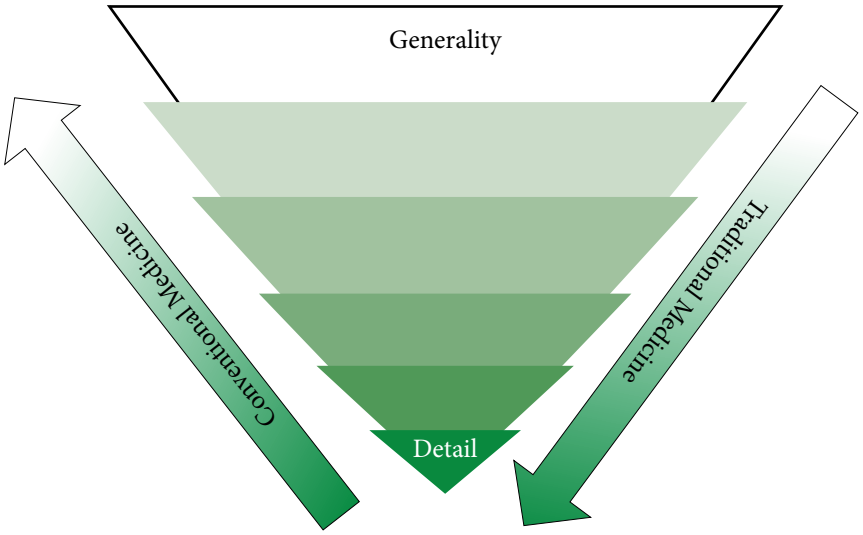
Element / Correspondence	Earth	Water	Fire	Air	Space (ether)
Characteristic	Dense, heavy, and hard	Liquid and soft	Hot and light	Cold, mobile, and rough	Clear and subtle
Sense	Smell	Taste	Sight	Touch	Sound
Task of element in body	Forming all solid structures and compact tissues	Forming plasma, cytoplasm, saliva, nasal secretions, eye secretions, and cerebrospinal fluid	Regulating body temperature; being responsible for digestion, absorption, and assimilation; recognizing, appreciating, and comprehending the world	Governing thought, desire, and will as well as cellular function, the movement of breath, and movements of the intestines	Making up most of the body; allowing the existence of sound
Humor[a]	Kapha	Pitta		Vata	
Function	Lubrication, structure, strength, stamina, compassion	Digestion, body temperature, hunger, thirst, confidence, cheerfulness		Nervous system, circulation, elimination, emotions, creativity	
Quality	Cold, heavy, moist, oily, stable, smooth, slow, firm	Hot, moist, intense, sharp, fleshy smelling		Light, dry, cool, rough, mobile, subtle	
Taste	Pungent, bitter, astringent	Bitter, sweet, astringent		Salty, sour, sweet	

[a]Changing in columns' position and their overlapping after the row of humors indicates the concept of forming 3 humors from combination of 5 elements in ayurveda. For example, kapha arises from earth and water; pitta arises from fire and water; and vata arises from the elements of space and air.

Table 3. The Correspondences of Basic Elements in Traditional Chinese Medicine

Element	Earth	Water	Metal	Fire	Wood
System	Digestion	Elimination	Respiration, elimination	Circulation of blood	Toxin processing
Sense organ	Mouth	Ears	Nose	Tongue	Eyes
Yin organ	Spleen, pancreas	Kidneys	Lungs	Heart	Liver
Yang organ	Stomach	Bladder	Large intestine	Small intestine	Gallbladder
Season	Late summer	Winter	Autumn	Summer	Spring
Climate	Dampness	Cold	Dryness	Heat	Wind

Figure 1. Differences Between Traditional and Conventional Medicines in Their Approaches



PHILOSOPHICAL BASES

The concepts of each previously mentioned medicinal system are rooted in the philosophy developed in the geographical cradle of that system. In fact, the philosophy and traditional medicinal systems in each area closely overlap. For instance, relationships between Greek or Muslim philosophy and TIM, or *samkhya* and ayurveda, or Tao-Confucian philosophy and TCM have been observed. This fact shows that rational methods have played important roles in establishment of these systems.

Unlike the experimental methods of Western science, which uses particular phenomena, or observations to build generalities (ie, hypotheses) through inductive reasoning, philosophy directs us toward an understanding of generalities through deductive reasoning, rather than observation of details (Figure 1).[17,18] The use of the rational methods of philosophy may be one of the great differences between the systems of traditional medicine and those of conventional medicine, which mainly has formed on the basis of experimental methods.

HOLISTIC VIEWS

Not only do the previously mentioned traditional systems hold a holistic view establishing the unity of all things in the world and the close link between humans and nature, but the systems focus on the whole body rather than an organ or a system. Whereas Western medicine narrowly focuses on the abnormal organ or system, traditional medicines target the balance and harmony of the whole body and try to re-establish it.[19-21]

BASIC ELEMENTS AS A BASIC PRINCIPLE

In TIM, 4 constituents known as elements (*arkan*)—earth, fire, water, and air—make up people and other beings in the world. Each element represents specific qualities in nature (Table 1). These elements combine to result in different qualities known as the temperaments (*mizajs*).The quantity of each element and the ratio of the elements in a combination are major determinants in the quality of a being. In fact, the quality of a being (eg, human temperament) is determined by the quality of its predominant element or elements.[22]

This fundamental structure is close to that of the 5 basic elements in ayurveda, which include the previously mentioned 4 elements, plus the element of space. However, the qualities of the elements are defined in somewhat different ways. Ayurveda attaches each element to 1 sense organ (Table 2).[15] Practitioners hold that the joining together of the 5 elements into different combinations leads to 3 humors (*doshas*), known as *vata, pitta,* and *kapha.* Vata arises from the elements of space and air; pitta arises from fire and water; and kapha arises from earth and water.

The theory of elements in TCM is known as the 5 phases theory (*wu-hsing*) (Table 3).[23] The key attribute of this theory is the dynamic change of the elements into each other in a cyclical manner, which is associated with the seasons, growth, and physical development. The dynamic relationships between phenomena during the processes of change are explained by a theory of opposites or mutual complements. In the views of TCM, all phenomena in the universe can be grouped into these pairs, called yin and yang. For example, whereas the qualities of yin are earth, water, motionlessness, and cold, the qualities of yang are heaven, fire, movement, and heat. Yin and yang permanently change each other.[15,21]

EVERYONE IS UNIQUE

From a TIM viewpoint, the ratio of elements when they combine to create an individual's *mizaj* (temperament) can be extremely different. Because infinite mizajs exist, such as personal fingerprints, each person's mizaj differs from those

of other people.[16] Moreover, the mizaj of different organs in a body can be different, whereas their total integration determines an individual's general mizaj. The mizaj at birth is termed *mizaj e jebelli*, or "innate temperament." It may be gradually altered to *mizaj e aarezi*, or "acquisitive temperament," by the influences of 6 factors[24]: (1) air, (2) body movement and repose, (3) sleep and wakefulness, (4) diet, (5) evacuation and retention, and (6) mental movement and repose. Because a human being is always influenced by these factors, proper management of them in a lifespan is necessary for health maintenance.[13,16]

From an ayurvedic perspective, an individual's combination of the 3 humors—pitta, vata, and kapha—is unique.[23] This combination remains unchangeable after birth and determines the congenital constitution of a person. Factors that principally affect the congenital constitution include the genetic material of sperm and ovum; the mother's food, drink, and habits during pregnancy; the state of the uterus; and the time of conception.[25,26]

Similarly, from a TCM perspective, each person possesses a unique combination of yin and yang.[23] Similar with the perspective of genetics in contemporary medicine, TCM proposes that everyone receives a basic principle for growth and living from their parents at conception, which is termed *jing*, or "essence." Each person's constitution is determined by his or her essence.[15,23]

HARMONY AND BALANCE IN THE BODY: HEALTH

Within every healthy human, a state of balance and harmony exists. In TIM, this balance is defined through 4 humors (*akhlat*). Humors are the body fluids into which food is initially converted. Each humor possesses qualities that affect a body's temperament and functions: (1) bile (*safra*) is warm and dry, (2) blood (*dam*) is warm and wet, (3) phlegm (*balgham*) is cold and wet, and (4) black bile (*soda*) is cold and dry.

When humors are out of balance, disharmony arises and results in disease. The balance of humors is different in everybody; so distemperament (*soo e mizaj*) is defined based on a person's normal humoral condition.[14,22]

In ayurveda, physical and mental health are defined according to the balance in the 3 doshas (humors). This balance results in a powerful digestion and elimination, great energy, and mental well-being. Balancing one's doshas does not mean trying to achieve an equal portion of vata, pita, and kapha. Interestingly, a person cannot change the ratio of doshas that are present from conception. Health is the balance of each individual's doshas according to one's normal ratio of doshas.[23]

As previously mentioned, in TCM, the duality of yin and yang is dynamic. Actually, yin and yang are not in an equalized condition, but rather they oppose each other. The consequence of this dynamism is qi (energy).[21]

DISHARMONY AND IMBALANCE: DISEASE

In TIM, the imbalance in body humors or distemperament is thought to be the cause of disease. The quality of the dominant humor in the body determines the nature of a disease. For example, warm diseases occur when yellow bile is dominant, whereas dominance of phlegm causes cold diseases. Therefore, treatment is based on the correction of temperament and humors to achieve a balanced state.

However, in TIM, diseases do not include only distemperaments. Rather, diseases are categorized into 3 classes, one of which is distemperaments. The other 2 classes, defined according to a body's anatomical and structural disorders, include disfigurements—when number, size, or structure of an organ is abnormal and deformed—and disconnections—when the connection of organs is abnormal.[22] In comparison with many other traditional systems, one of the important characteristics of TIM that makes it unique is perfect knowledge in the areas of anatomy, neurology, and histology.

From an ayurvedic point of view, it can be surmised that an imbalance of doshas causes disease. For instance, an increase in vata dosha shows up as dry skin, anxiety, insomnia, decreased strength, constipation, arthritis, hypertension, and cardiac arrhythmia. An increase in pitta dosha manifests as excessive body heat, skin disease, peptic ulcers, anger, frustration, and self-criticism. An increase in kapha dosha leads to coldness, excessive sleep, bronchitis, asthma, sinusitis, and lethargy.[15,23] Factors that make the doshas imbalanced can be internal—diet, mind, emotions, and body—and/or external—environment and lifestyle.[3]

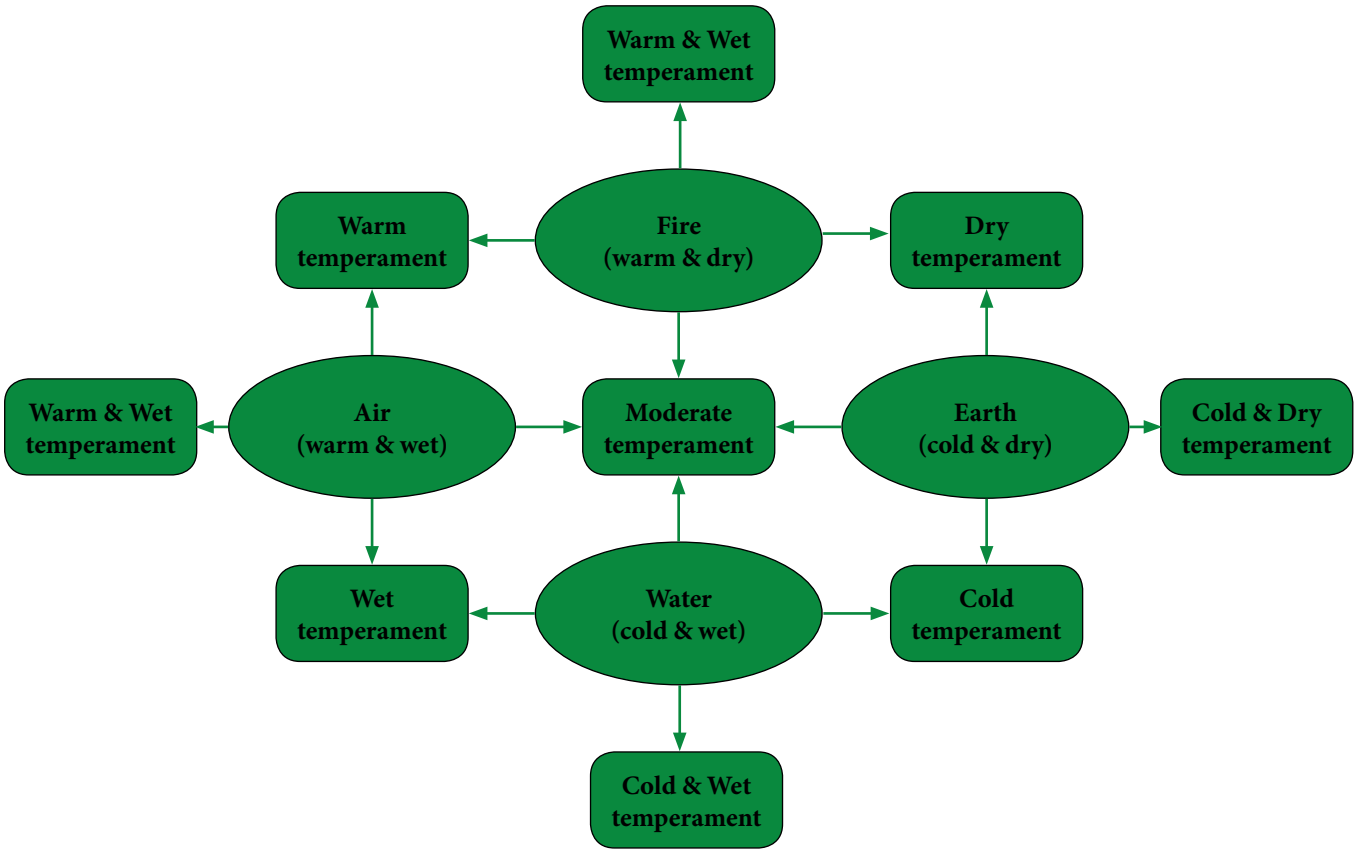
In TCM, an overabundance of yin causes yang diseases and an overabundance of yang causes yin diseases. In adverse health conditions, the yang energy—heavenly energy—descends, whereas yin energy—earthly energy—ascends. Any imbalance is believed to cause a disturbance in the natural flow of energy, such that eventually qi—the vital energy—is blocked, resulting in illness. Excessive yang and excessive yin lead to heat or cold syndromes, respectively; deficient yang leads to hyperactivity of yin and cold syndromes of a deficient type; and deficient yin leads to heat syndromes of a weak type.[15,21]

PERSONALIZED APPROACHES

As mentioned earlier, the goal of treatment in these traditional systems is to keep or recover every individual's unique balance of (1) humors in TIM; (2) of doshas (humors) in ayurveda, or (3) of yin and yang in TCM. Therefore, practitioners must design their treatments to fit each client's temperament or constitution. On the other hand, every patient requires a personalized approach to achieve an efficient diagnosis and treatment. Unlike Western medicine, patients with the same complaint may receive completely different remedies.

In TIM, foods and drugs are selected according to the quality that they can create in the body. In this system, drugs that create opposite qualities are prescribed to normalize the imbalance in the humors (eg, for cold distemperament, a warming drug is prescribed).[27] In addition, other factors must be considered, such as the gender, age, occupation, power, physique, and habits of a patient, together with the

Figure 2. Temperament Types in Traditional Iranian Medicine



season and location.[24] Similarly, opposite dietary interventions are used in TCM (eg, warming foods are yang and are added to the diet of a patient with yin excess to rebalance the ratio of yin and yang).[23]

BODY TYPES

Because the previously mentioned traditional systems have a completely personalized approach, the determination of the precise temperaments and constitutions of people is cardinally important. However, the types of innate temperaments or constitutions are infinite. To facilitate determination of an individual's temperament or constitution, the systems have categorized people into different body types.

In TIM, people fall into 9 types of temperaments (Figure 2).[24] When the 4 basic elements are combined equally, a moderate temperament is created; otherwise immoderate temperaments appear. Immoderate temperaments can be (1) simple—such as cold, warm, dry, or wet temperaments, when 2 elements or their qualities are equally predominant; or (2) complex—such as warm and dry, warm and wet, cold and dry, and cold and wet temperaments, when 1 element or its qualities are predominant. In addition, the 4 types have been identified as choleric, sanguine, melancholic, or phlegmatic, and the terms are used only for patients with distemperaments.[20,24] Every temperament type has its own distinctive signs and symptoms, helping practitioners to distinguish it. The assessments that are considered for determining a person's innate type of temperament include (1) touch; (2) physique; (3) hair; (4) complexion; (5) sleeping habits; (6) body functions; (7) body wastes; (8) smallness and largeness of organs; (9) effects of the 4 qualities—coldness, warmness, dryness, and wetness—on the body; and (10) emotions. For example, a dry type often will have stiff and dry touching, a thin body structure, rapid hair growth, prolonged sleep, constipation, sensitivity to dryness, and good memory.[24]

In ayurveda, body types, which are known as *prakruti*, are based on a person's physical and mental constitution. The 3 doshas in their different combinations in different people create 10 body types (Figure 3).[15] Few people are single-dosha types. Most are 2-dosha types, with 1 dosha predominant but not extreme. The dominant dosha gives people their primary reactions to the world, which are then moderated by the second dosha. Similar with TIM, each type is distinguished by special traits and features. For instance, the vata type is unpredictable; is responsive to sound and touch; is happy; is enthusiastic; is thin and very active; has dry and stiff skin; has dry and curly hair; is constipated easily; and is fearful, anxious, and forgetful.[15,23]

Figure 3. Body Types in Ayurveda

TCM categorizes people into 9 types of constitutions: (1) normal, (2) yang deficiency, (3) yin deficiency, (4) phlegm dampness, (5) qi deficiency, (6) dampness heat, (7) blood stasis, (8) qi-stagnation, and (9) a type inheriting a special constitution. The categorization is based on (1) the yin-yang concept, (2) the 5 elements, (3) body posture, (4) functional character, and (5) mental characteristics. For example, a damp type (1) is overweight or bloated because of the accumulation of water; (2) is fatigued and sleepy in the daytime; and (3) is inactive, prefers sweet food, is sensitive to damp weather, and has a low metabolic rate.[28,29] Besides, TCM practitioners classify patients according to their disharmonious pathogenesis and use clinical information obtained from TCM's 4 main, diagnostic processes: looking, listening and smelling, questioning, and touching—in different *zhengs*.[30,31] In brief, the term *zheng* identifies a pattern of objective evidence of a disease at a certain stage, and it represents a sequence of clinical phenotypes.[32,33] Zheng differentiation is a process of defining and diagnosing disease or body imbalances by assessing clinical information. In clinical practice, it enables TCM practitioners to decide on and perform appropriate treatment, such as acupuncture, and to prescribe various Chinese herbs and foods based on the body's pathological changes.[32,34] Based on zheng theory, practitioners may classify patients who have contracted the same disease into different zheng types, although different diseases may manifest in the same zheng type.[31,32] In TCM, treatments are based on a patient's zheng type rather than the disease from which he or she suffers.[35] Qi, blood, fluid, yin and yang, and vital organs of the body are generally considered for zheng classification.[31,36] For instance, Chen and Wang[32] determined that *xue-yu zheng* (blood stasis), *shi-re zheng* (dampness-heat), *yin-xu zheng* (yin deficiency), and *pi-xu* (spleen deficiency) are the most common zheng types in cancer. Also, Yang et al[32] have indicated that lung qi deficiencies and spleen qi deficiencies are 2 main zheng types for allergic rhinitis.[37]

GENETIC BASIS OF BODY TYPES

As previously mentioned, defined body type determines a person's physical, physiologic, and psychological character, and more important, susceptibility to various diseases. Predicting vulnerabilities of various body types to various diseases can let traditional systems prevent diseases through creating appropriate lifestyles and environments.[38] In addition, differences of various body types in disease

susceptibility provide evidence for a genetic base to traditional typology. A study on ayurveda has demonstrated that a person fitting into the vata body type is more prone to Parkinson's disease[39] and that individuals fitting into the vata-kapha and kapha types exhibit strong susceptibility to diabetes, hypertension, dyslipidemia, insulin resistance, and elevation of inflammatory markers.[40] Moreover, it is indicated that platelet aggregation and response to aspirin among persons fitting into the vata-pitta type are higher than for other types.[41] Additionally, a case control study has shown a correlation between insomnia and TCM constitutions.[42]

Some researchers have taken a drastic step forward and have studied the correlation between body types and genotypes. A significant association between the *CYP2C19* genotype and the body types of ayurveda has been demonstrated.[43] Another study showed a significant correlation between the *HLA* type and body types.[44] A similar relationship was also shown between *HLA* types and TCM constitutions.[45] Researchers in TCM have performed a genetic study that showed an association between genetic variations of metabolic genes—including *PPARD*, *PPARG*, and *APM1*—and the constitutions.[46] Polymorphism of *WNT10B*, associated with obesity, was found to be associated with Yin deficiency.[47]

New research has also found evidence of differences in gene regulation for different body types. With respect to TCM, the phlegm-dampness constitution was found to be associated with up-regulation in 4 genes: *COPS8*, *GNPDA1*, *CD52*, and *ARPC3* and down-regulation in 6 genes: *GSPT2*, *CACNB2*, *FLJ20584*, *UXS1*, *IL21R*, and *TNPO*, which can result in susceptibility to hyperlipidemia and diabetes.[48] Another study revealed up-regulation of 785 genes and down-regulation of 954 genes in the yang-deficient constitution in comparison with a balanced constitution.[49] Prasher et al[50] indicated significant differences in many biochemical and genome-wide levels of expression of 3 types of doshas, particularly in lipid profiles, levels of serum uric acid, LDL levels, prothrombin time, and expression of genes related to fibrinolysis.[50] The outstanding results of that study revealed a significant variation in the functional group of genes in different Prakruti body types (eg, distinctive expression of genes regulating cell division in the vata type, genes regulating immune surveillance in the pitta type, and genes regulating anabolism in the kapha type).[50,51]

Moreover, researchers are increasingly interested in providing a context for exploiting the concept of zheng in contemporary medicinal approaches to promote personalized medicine. For example, Liang et al[52] showed a correlation between different zheng symptoms—TCM diagnosis—and the severity factors of the symptoms of allergic rhinitis—contemporary diagnosis. In a study on modeled xenograft mice with pancreatic cancer that had dampness-heat, spleen deficiency, or blood-stasis zheng, common zheng types in pancreatic cancer, it was revealed that tumors of the different models had a different molecular basis and markedly different tumor growth and response to herbal medicine.[53] Another study suggested that the difference in expression level of *CCR5*/*CCL5*/*CCL4*, a ligand of pancreatic tissue proteins, could cause a difference in the growth of the pancreatic tumor in different zheng types of prognostic cancer.[54] In addition, in a study between 3 common zheng types in participants with high-normal blood pressure—*ping he*, *yin xu*, and *tan shi*—the latter type was shown to have a significant relationship with multiple risk factors for cardiovascular disease, such as high BMI and elevated blood lipids.[55] Zhang et al[56] used circulating miR-583 and miR-663 for differentiation of liver-gallbladder, dampness-heat syndrome, and liver-kidney yin-deficiency syndrome as 2 common zheng types in chronic hepatitis B. Using urinary metabonomics, excess and deficiency zheng types were differentiated in patients with chronic hepatitis B.[57]

PERSONALIZED MEDICINE: A NEW PERSPECTIVE

The first decade of the 21st century saw a simultaneous introduction of genomics and proteomics in drug discovery and development. Some studies have explored genomic and proteomic differences between individuals with the intent of finding a way to predict each patient's response to a medicine. These studies have led to development of personalized medicine. In its contemporary conception, personalized medicine generally has been limited to getting information about pharmacogenetic and pharmacogenomic variations in patients to prescribe safer and more effective drugs for each one.[58,59] Pharmacogenetics generally focuses on genetic variation in drug-metabolizing enzymes, whereas pharmacogenomics investigates the relationship between genetics and drug response, mainly through genotyping patients in different groups.[60] Therefore, the meaning of personalized medicine in its contemporary approach is different from its meaning in the traditional approaches, because both genetic and environmental factors are considered in the traditional approaches. Traditional medicine would indicate that diet and drug prescriptions need to be made according to each individual's internal and external factors.[58,61]

Finally, in addition to pharmacogenomics, other omics gradually have entered the realm of personalized medicine. Omics such as genomics, the proteomics, the metabolomics, the epigenomics, the transcriptomics, the antibodyomics, and other omics based on molecular characteristics of patients can provide information for finding medicine tailored to them.[62] For example, metabolism plays a great role in a patient's response to any drug because it involves absorbance and the distribution of drugs and the ability of a drug to reach its own target, detoxification, and even toxicity. In addition, the level of metabolizing enzymes, together with differences between individuals, might determine the safety and efficacy or adverse effects of diverse drugs. Pharmacometabolomics is a technology employing metabolomics to differentiate an individual's metabotype and to evaluate his or her drug metabolism.[63,64]

VALUE OF BODY TYPES FOR PERSONALIZED MEDICINE

Undoubtedly, personalized medicine can improve health in 2 ways, prognosticating both the disease risk among healthy individuals and the treatment response among patients.[65] Despite personalized medicine's value in the prevention and treatment of disease, a large gap exists between this concept and its true feasibility in clinical practice. Because of the complexity of human genomics and the many genetic variations underlying the risks for diseases, a large number of studies are required.[66] Aside from the need for great investment, which only developed and rich countries can afford,[59] another problem is the chaotic and large amount of information that must be produced for a detailed understanding of genetic variations. To solve the problems, researchers have attempted to make a correlation between genotype and phenotype and to categorize people into groups based on that information.[67,68] Variations in phenotype characteristics may reveal differences in the underlying genetic risk of disease.[69]

As previously mentioned, many scientific validations demonstrate genetic bases for body types in traditional medicine as well as the correlation between genotypes and body types. Indeed, body typology in traditional systems of medicine offers a new approach that can be advantageous for contemporary personalized medicine in its attempts to reach its objectives. Furthermore, personalized medicine that use the approach of typology can help practitioners to predict disease vulnerability, disease severity, and drug response within each type.[51] Accordingly, new concepts such as ayurgenomics are emerging from a joining of ayurveda and genomics. Ayurgenomics is a new systematic approach studying genetic variations between prakruti body types, with the prospect of supporting the promotion of personalized medicine.[70,71] Recently, the application of omics techniques has significantly increased in TCM. Called zhengomics, the approach involves proteomics, metabolomics, and other information about an individual according to zheng classification theory. As an advantage, zhengomics employs mathematical analysis, such as bioinformatics, to combine the obtained information.[72]

The other new development is that personalized medicine recently started to benefit from "systems biology" for integrating, modeling, and analyzing the complex data obtained from different omics studies.[59] In this way, systems biology—a new field by which complex data are integrated and analyzed through computational/mathematical modeling activities—have impressively increased scientists' capacity to predict disease and drug responses in a holistic way.[73] According to the growing application of omics technologies in traditional systems of medicine, TCM tries to use systems biology to advance its personalized approach.[74] Other traditional systems can also benefit from systems biology for development and globalization.

CONCLUSION

The diagnostic and therapeutic procedures of the 3 previously mentioned traditional systems seem different at first glance, but many similarities can be found in their general principles. These systems owe a large part of their success to their similar principles, such as holistic views, personalized approaches, and typologies, whereas conventional medicine fails to consider these factors completely. Conventional medicine has now reached a point where it has found a response to the demand for personalized medicine to be necessary. Personalized medicine is the point at which traditional medicine meets contemporary medicine. Contemporary medicine, by moving from detail toward a general concept, ignores some other details and aspects. As a clear example, environmental factors may cause many illnesses and deaths in the world and affect the success of therapy by changing drug metabolism and toxicity,[75] but contemporary personalized medicine has failed to consider them so far.

Traditional medicine, because of its holistic view, is able to consider all the relevant aspects and details of a generality (ie, both constitutional and environmental factors). On the other hand, contemporary medicine benefits from global methods that are known and applicable all over the world. Integration of traditional and contemporary medicine can dramatically improve all health systems.

Fortunately, after a long controversy between contemporary and traditional medicine, they have now reached a convergence in which each confirms the other. The science of genetics now confirms some concepts and methods of traditional medicine, and traditional medicine's typologies can support new programs of personalized medicine. Omics technologies are about to modernize traditional practices. Therefore, a new context of research has been provided for researchers in both fields.

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Request PDF | Personalized Medicine: A Confluence of Traditional and Contemporary Medicine | Context: Traditional systems of medicine have attained great popularity among patients in recent years. Success of this system in the treatment | Find, read and cite all the research you need on ResearchGate.Â Finally, this study investigates the possibility that conventional medicine could benefit from traditional typology to improve its personalization. Personalized medicine: a confluence of traditional and contemporary medicine. Alternative therapies in health and medicine, 2014. [31]. Personalized medicine: a confluence of traditional and contemporary medicine. 2014. [32].Â Traditional Chinese medicine for prevention and treatment of hepatocarcinoma: From bench to bedside World Journal of Hepatology, 2015 DOI:10.4254/wjh.v7.i9.1209. [11]. Therapeutic Applications of Herbal Medicines for Cancer Patients Evidence-Based Complementary and Alternative Medicine, 2013 DOI:10.1155/2013/302426. [12]. Personalized medicine (PM) is an emerging practice of medicine that uses an individualâ€™s genetic profile to guide decisions made in regard to the diagnosis, prevention and treatment of diseases. Personalized medicine is being advanced through data from the Human Genome Project.Â Notably PM will not change traditional therapy however, in regards to biomarkers; it might create a safe and effective therapy for every individual patient. Knowledge of a patientâ€™s genetic profile can help physicians select the proper medication or therapy and administer it using the proper dose or regimen.Â Personalized medicine will create significance value for the healthcare system but there is a quite a bite of debate over where the value will accrue. Keywords: Personalized medicine; Biomarkers. Do not take any other medicines or herbal remedies with an antibiotic, including those you have bought without a prescription, before talking to your doctor or pharmacist. Certain antibiotics (e.g. penicillins, cephalosporins) can reduce the effectiveness of oral contraceptives. If you have diarrhoea or vomiting while taking an antibiotic, the absorption of the pill can be disrupted.Â There are a number of important interactions between antibiotics and other medicines so it's important to tell which your doctor or pharmacist about any other medicines you are taking. Antibiotics are usually taken orally but can also be given by injection, or applied to the affected part of the body such as the skin, eyes or ears.